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SCIENCE SPOTLIGHT

# Respiratory Infection Category Influences Survival in Transplant Patients

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Respiratory virus infections impact the wellbeing and quality of life of otherwise healthy individuals, but rarely result in death. However, for immunocompromised patients, such as those who have undergone hematopoietic stem cell transplants, these viral infections can be life-threatening. Consequently, a great deal of attention must be given to adequately diagnosing and monitoring these infections in transplant patients. The current methods for diagnosing lower respiratory tract disease (LRD) caused by the respiratory virus parainfluenza following transplantation are not well-defined. A recent study published in *Clinical Infectious Diseases* by the Dr. Michael Boeckh Group (Vaccine and Infectious Disease Division) determined that by categorizing LRD diagnoses into possible, probable, or proven cases, clear differences were seen in patients' chances of survival.

For stem cell transplant patients, a diagnosis of LRD can signify a substantially reduced chance of survival. The extent of this risk is not clearly known, as previous studies have found that mortality in those patients with LRD ranges widely, with estimates from 13 to 63%. Researchers in the Boeckh lab believe that these disparities might stem from imprecise criteria for diagnosing LRD. Dr. Sachiko Seo, a research associate and lead author of the study explained, "In previous studies, the definitions of lower respiratory tract disease differ among studies, resulting in difficulties to compare results between different studies."

Patients diagnosed with LRD often include individuals who despite having lower respiratory tract symptoms, have had the parainfluenza virus detected only in their upper respiratory tract. Seo et al. categorized this group of patients as "possible" LRD cases. If the virus was detected in the lower respiratory tract, via a lung biopsy or a bronchoalveolar lavage, a patient was categorized as either "probable" or "proven" LRD, depending on other symptoms. With this categorization in place, the researchers examined the differences in survival rates for patients who received stem cell transplants at Fred Hutchinson Cancer Research Center from 1990 to 2011. They also analyzed several other variables that could affect chance of survival.

The most important results were that the probability of survival at 90 days following transplantation was lower for proven or probable LRD cases than for possible cases (45%, 58% and 87%, respectively). When compared with patients with upper respiratory tract infection (an entirely different and less threatening diagnosis), the chance of survival was significantly lower for proven or probable LRD cases ( $p < 0.001$ ), while for possible LRD cases, it was not.

Upon further examining the variables that contributed to increased risk of mortality, the researchers discovered that low monocyte counts, high-dose administration of steroids or oxygen requirement each were associated with high mortality in proven and probable LRD cases.

The conclusions of this study should play a role in assigning appropriate criteria for LRD diagnosis in the future. Dr. Seo explains, "We demonstrated that these three groups have different survival outcomes." She predicts the utility of the categorization in future studies. "Our new classification will work as a standard definition of lower respiratory tract disease and consensus endpoint for clinical trials for parainfluenza virus, and potentially other respiratory viruses in the future."

[Seo S, Xie H, Campbell AP, Kuypers JM, Leisenring WM, Englund JA, Boeckh M.](#) 2014.

Parainfluenza Virus Lower Respiratory Tract Disease after Hematopoietic Cell Transplantation: Viral Detection in the Lung Predicts Outcome. *Clin Infect Dis*. Epub ahead of print, doi: 10.1093/cid/ciu134

See also: [Boeckh M.](#) 2008. The challenge of respiratory virus infections in hematopoietic cell transplant recipients. *Brit J Haematol* 143:455-67.

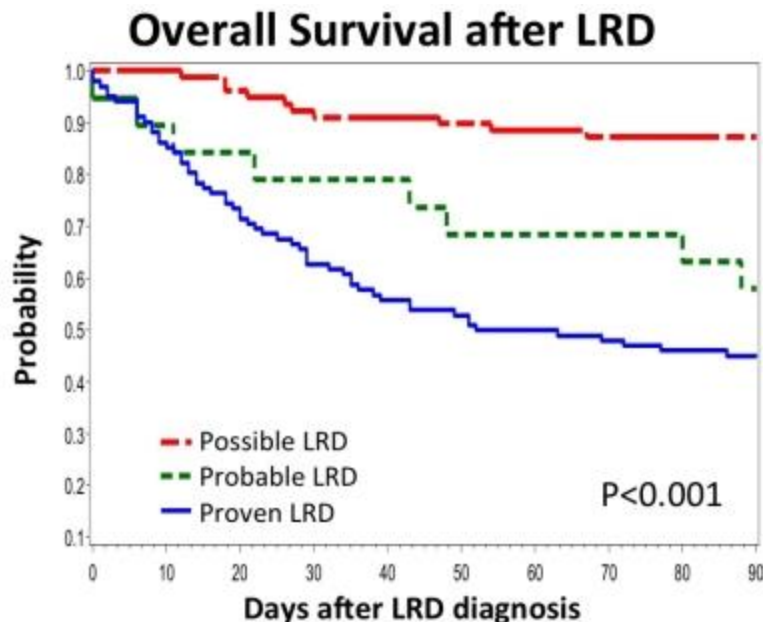


Image provided by Dr. Sachiko Seo.

The chances for 90-day survival following stem cell transplantation are lower for probable or proven cases of lower respiratory disease (LRD) compared to possible cases.